

REMARKS/ARGUMENTS:

Claims 1-25 have been examined. Claims 1-3, 9-16, 19, and 22-25 have been rejected. It is noted with appreciation that claims 4-8 and 20-21 have been deemed to be directed towards allowable subject matter. The present response amends claims 2, 9, 14, 22, and 24 and adds new claims 26-29. Accordingly, claims 1-29 are now pending. Reconsideration and allowance of all pending claims are respectfully requested. A supplementary Information Disclosure Statement is also being filed herewith.

Claims 1, 3, 12-13, 16, and 19 have been rejected under the judicially created doctrine of obviousness-type patenting as being unpatentable over claims 1-16 of U.S. Patent No. 6,549,592. To expedite prosecution, a Terminal Disclaimer is being submitted with reference to U.S. Patent No. 6,549,592. The rejection is therefore overcome and its withdrawal is respectfully requested.

Claims 2 and 14-15 have been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,314,082 issued to Malmgren (hereinafter “Malmgren”). Independent claims 2 and 14 are generally directed towards use of an OFDM burst structure where periodically spaced frequency domain symbols of a burst have non-zero values and frequency domain symbols between these periodically spaced frequency domain symbols have null energy. The rejection points to columns 8 and 9 of the Malmgren patent which describe an OFDM NULL signal that can be used in the context of digital audio broadcasting standards. The structure of the so-called NULL signal consists of a predefined pattern of sub-channeled pairs that have assigned values with presumably zero values being transmitted between the pairs. The Malmgren patent teaches using the signal structure to facilitate selection from among multiple digital audio broadcasting sources.

Embodiments of the present invention exploit the claimed OFDM burst structure in, for example, timing synchronization. To clarify the distinctions between the claimed invention and the prior art, claims 2 and 4 have been amended to require that “**all** frequency domain symbols between said periodically spaced frequency domain symbols have null energy.” This limitation does not hold true in the NULL signal structure described by the equation at line 50 of column 8

in Malmgren. The pattern of the burst described there consists of periodically spaced pairs of adjacent sub-channels. Thus it is not true that all of the symbols between the periodically spaced frequency domain symbols have null energy. It should be kept in mind that where the Malmgren patent refers to a "symbol," this is generally referred to as a "burst" in the present application and where Malmgren refers to a "sub-channel" this may be referred to as a "frequency domain symbol" in the present application.

Claims 2 and 14 further require that the "periodically spaced frequency domain symbols are spaced at least 4 symbols apart." The rejection points to Figs. 2 and 3 and column 5, lines 11-20 of the Malmgren patent as showing this feature. Fig. 2 depicts multipath propagation for a broadcast system and does not appear to be relevant in any way to the limitation. Fig. 3 depicts overall digital audio broadcasting signal structure and refers to spacing of OFDM symbols (bursts in the language of the present application) without making any reference to the arrangement of what would be described as sub-channels in the Malmgren patent. Column 5, lines 11-20 also described propagation in a broadcast system. Claims 2 and 14 are allowable over the art of record.

Claim 15 is allowable for at least the reason of its dependence from claim 14. The rejection of claim 15 points to text at columns 5-6 of Malmgren as describing overall structure of a digital audio broadcast signal. Claim 15, through its incorporation of parent claim 14, defines a particular OFDM burst structure. The rejection, by contrast, points to disparate elements that extend across multiple bursts of an OFDM digital audio broadcast signal and does not identify any teaching of a single burst having all of the recited characteristics including that "at least one of said periodically spaced frequency domain symbols carry data." This is further reason for the allowability of claim 15.

Claims 9-11 and 22-25 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Malmgren in view of U.S. Patent No. 5,909,470 issued to Barratt et al. (hereinafter "Barratt"). Independent claims 9, 11, 22, and 24, as amended, recite a similar OFDM bust structure to that recited in independent claims 2 and 14 described above. As has

been explained, the Malmgren patent fails to disclose this burst structure. The Barratt patent does not remedy the deficiencies of the Malmgren patent in this respect. This is sufficient reason for the allowability of independent claims 9, 11, 22, and 24.

Furthermore, it would not have been obvious to combine the Barratt and Malmgren patents. The signal structure of Malmgren was developed for use in selecting from among multiple digital audio broadcast sources and there is no indication therein that it would be suitable for use in synchronization by use of a cost function. This is further reason for the allowability of independent claims 9, 11, 22, and 24. Dependent claims 10, 23, and 25 are allowable for at least the reason of their dependence from their allowable patent claims. Claim 25 is further allowable on its own merits for the reasons discussed in connection with claim 15.

Conclusion:

For the foregoing reasons, Applicant believes all the pending claims are in condition for allowance and should be passed to issue. If the Examiner feels that a telephone conference would in any way expedite the prosecution of the application, please do not hesitate to call the undersigned at (408) 446-8694.

Respectfully submitted,



Dan H. Lang
Reg. No. 38,531

RITTER, LANG & KAPLAN LLP
12930 Saratoga Ave., Suite D1
Saratoga, CA 95070
Tel: 408-446-8690
Fax: 408-446-8691